Petition for Rulemaking filed by Medtronic Inc., RM-11271

Comments by Dr. W. G. Scanlon

There are many advantages and benefits associated with use of wireless technology for medical applications of body area networks [1]. Therefore, I am very supportive of this petition and I recommend that it should be approved, subject to one technical issue concerning Section 95.639 Maximum Transmitter Power.

The petition suggests that (subsection (i)(3)) that "For a body-worn MEDS transmitter, the measured field strength on an open area test site shall be reduced by 4 dB to account for body absorption effects on radiated power." However, while this 4 dB factor is a reasonable estimate for the reduction of total radiated power, the EIRP will may in fact increase in the outward direction normal to the body surface. Many of the early textbooks concerning bodyworn UHF antennas [2][3][4] describe both theoretical and heuristic results showing a distinct directive gain irrespective of the expected 2 – 5 dB losses (at 400 MHz) in biological tissues. These texts conclude that the directive gain may be as high as 5–6 dB for magnetic antennas with this reducing as the antenna-body separation is reduced. This was confirmed in the work reported in [5] where both FDTD and measured results were presented for a chest-mounted loop antenna at 418 MHz. See [6] for a wider discussion of bodyworn antennas.

In addition, this effect is dependent on the antenna-body separation which may vary in practice due to natural patient movement. Therefore, I contend that the 4 dB factor should be removed in the interests of minimizing potential interference to other users in the bands concerned. My recommendation is that this clause is simply deleted.

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